

AMENDMENTS TO THE CLAIMS

1. (Original) A varactor diode on a semiconductor substrate, comprising:
 - a well region of a first conductivity type in the substrate;
 - a plurality of isolation regions on upper portions of the well region;
 - a plurality of masking structures having first and second sides formed on the substrate between respective ones of said plurality of isolation regions;
 - a first plurality of diffusion regions of a second conductivity type, at least some of said plurality of diffusion regions abutting respective ones of said plurality of isolation regions; and
 - a second plurality of diffusion regions of said first conductivity type abutting portions of said first plurality of diffusion regions that do not abut respective ones of said plurality of isolation regions, said second plurality of diffusion regions extending below respective sides of respective ones of said plurality of masking structures, wherein respective ones of said second plurality of diffusion regions do not contact one another.
2. (Original) The diode of claim 1, further comprising a first electrical connection that interconnects said first plurality of diffusion regions.
3. (Original) The diode of claim 2, further comprising a second electrical connection to said well region.
4. (Original) The diode of claim 1, wherein said second plurality of diffusion regions have a dopant concentration greater than said first plurality of diffusion regions.
5. (Original) The diode of claim 4, wherein said second plurality of diffusion regions have a hyperabrupt doping profile.

6. (Currently Amended) The diode of claim 4, wherein said second plurality of diffusion regions have a dopant concentration of approximately 1×10^{11} atoms/cm².

Claims 7-12. (Canceled)

13. (Original) A varactor diode having a first electrode comprising a well region of a first conductivity type in a substrate, a second electrode comprising a first plurality of diffusion regions of a second conductivity type abutting isolation regions disposed in said well region, and a second plurality of diffusion regions of said first conductivity type extending laterally from portions of said first plurality of diffusion regions not adjacent said isolation regions and having a dopant concentration greater than that of said first plurality of diffusion regions.
14. (Original) The varactor of claim 13, wherein said varactor has a Q of at least approximately 100 at a circuit operating frequency of approximately 2GHz and a tunability of at least approximately 2.5 to 3.5 in a range of applied voltage between approximately 0V to 3V, respectively.

Claims 15-17. (Canceled)